CLAIMS

1. A regenerative counterflow heat exchanger for gaseous media, in particular an air heat exchanger for air ventilation in buildings, with a heat exchanger drum through which heat-emitting and heat-absorbing gaseous medium flows in an alternating sequence, the active surface of said drum consisting of a multilayered network, whereby at least one ventilator generates a flow of incoming air and at least one ventilator a flow of outgoing air, characterized in that the heat exchanger drum substantially forms the fixed outer limit of the device.

2. The regenerative heat exchanger of a rotating type of design, characterized in that the drive of the heat exchanger drum is produced by a flow of air provided with a spin.

3. The air flow drive according to claim 2, characterized in that the off-flow of an axial air feed ventilator is directly used as the flow of air provided with a spin.

4. The heat exchanger according to claim 1, characterized in that it is at least partly supported magnetically.

5. The heat exchanger according to claim 1, characterized in that contactless gap seals are exclusively employed as

sealing elements.

6. The heat exchanger according to claim 4, characterized in that the support of the magnet at the same time has a sealing function.

7. The heat exchanger according to claim 1, characterized in that an outer perforated sheet metal plate is in thermal contact with the face-side rings in order to approximately maintain said rings at room temperature.

8. The heat exchanger according to claim 1, characterized in that a relatively "cold" inner perforated sheet metal plate is thermally insulated.

9. The heat exchanger according to claim 1, characterized in that the drum can be pulled off axially without obstruction.

10. The heat exchanger according to claim 1, characterized in that after the drum has been pulled off, the face-side central bearing remains in the cross bar.

11. The heat exchanger according to claim 1, characterized in that the axial drum positioning is provided with a compensating device acting dependent upon the outside temperature.

12. The heat exchanger according to claim 1, characterized in that the axial position of the heat exchanger drum and thus the loss-causing sealing gap are adjustable from the outside.

13. The heat exchanger according to claim 1, characterized in that a face-side closure of the drum consists of a transparent material.

14. The heat exchanger according to claim 1, characterized in that the drum is axially fixed from the closed face side.

15. The heat exchanger according to claim 13, characterized in that the transparent material is glass.

16. The heat exchanger according to claim 4, characterized in that the main magnet support in the upper half of the drum is supplemented by a second magnet support in the lower half, said second magnet support acting in the opposite direction and thus reducing the bearing capacity.

17. The heat exchanger according to claim 4, characterized in that only permanent magnets are employed for the support.

18. The heat exchanger according to claim 4, characterized in that the direction of magnetization of a part magnet system

extends parallel with the axis of the drum, and that the diameter of the stationary system is slightly smaller than the diameter of the rotating system.

19. The heat exchanger according to claim 1, characterized in that the rotor is mechanically fixed in one single bearing point in a way such that the rotor axle is capable of moving only within a cone, the tip of the latter being displaceable only one one single axis.

20. The heat exchanger according to claim 1, characterized in that after releasing one single, centrally arranged fixing device, the latter is unlosably retained in one of the components to be separated.

21. The heat exchanger according to claim 1, characterized in that for compensating thermal expansion, highly elastic intermediate elements are employed for the glass pane/central bearing receptacle or outer rings/inner perforated sheet metal plate or disk installation ring/ventilator mounting device or ventilator mounting device/ventilator race configurations.

22. The heat exchanger according to claim 1, characterized in that the longitudinal bar is mounted in such a way that

any angular positioning inaccuracy on an axis extending perpendicular to the axis of rotation of the rotor has no influence on the center point of the fixed rotor support.

23. The heat exchanger according to claim 1, characterized in that the cross bar is a part of a component produced on a turning lathe, or derived from such a component.

24. The heat exchanger according to claim 1, characterized in that viewed in the direction of the axis of rotation, the longitudinal bars serving at the same time as sealing elements between the incoming air chamber and the outgoing air chamber divide the chamber circumferences or chamber lengths acted upon by air in the circumferential direction as required, so that each axial chamber section is basically complementarily acted upon by identical volumes of air.

25. The heat exchanger according to claim 22, characterized in that the longitudinal bar is mounted thermally insulated on the installation ring.

26. The heat exchanger according to claim 1, characterized in that the incoming air directed at the ventilators flows through a twist-absorbing element, for example a honeycomb-like grid.

27. The heat exchanger according to claim 1, characterized in that after passing through the heat exchanger, the off-air flows through one or a plurality of twist-absorbing elements.

28. The heat exchanger according to claim 1, characterized in that the ventilator rotors and their supports form magnetically fixed units, the latter being axially removable without tools.

29. The heat exchanger according to claim 1, characterized in that the heat of the bearings and the heat of the motors of the ventilators is transferred via a bearing tube to a counterweight located in the flow of air.

30. The bearing tube according to claim 29, characterized in that said tube is supported in a housing and damped therein against vibration.

31. The vribation damping according to claim 30, characterized in that the vibration damper is designed also as a sound absorber in the form of a silicone foam in order to reduce higher-frequency commutation noise.

32. The heat exchanger according to claim 1, characterized in that the ventilator suspension in a race is designed in a way such that the unit is suspended in the center of gravity and vibrations are largely damped already in their sites of origin, so that the mounting can be designed very weak, effecting low development of noise and an increased rate of air flow.

33. The heat exchanger according to claim 1, characterized in that the rotors run with very tight clearance in their casings.

34. The heat exchanger according to claim 1, characterized in that elements shaping the flow are fixed magnetically.

35. The heat exchanger according to claim 1, characterized in that a flow-shaping element is arranged on the blow-out side on the room side, such element preventing fresh infeed air from directly flowing into the upper suction zone, such element, in the simplest case, being a short apron which, with the help of the air exiting from the last 10% of the heat exchanger, deflects the residual air downwardly by jet effect.

36. The heat exchanger according to claim 1, characterized in that the off-air on the room side is sucked off from the top and the fresh feed air is blown downwardly.

37. The heat exchanger according to claim 1, characterized in that the entire zone within the diameter of the heat exchanger is largely transparent.

38. The heat exchanger according to claim 1, characterized in that the ventilators are arranged within the diameter of the heat exchanger.

39. The heat exchanger according to claim 1, characterized in that both ventilators are arranged at the same temperature level.

40. The heat exchanger according to claim 39, characterized in that both ventilators are arranged at the outside temperature level.

41. The heat exchanger according to claim 1, characterized in that the wall separating the chambers is removable downwardly.

42. The heat exchanger according to claim 40, characterized in that said wall is fixed magnetically.

43. The heat exchanger according to claim 1, characterized in that the wall separating the chambers is designed as a sound absorber.

44. The heat exchanger according to claim 1, characterized in that the space disposed on the inside contains a flat, stationary sound absorber located directly in front of the closed face side of the drum.

45. The heat exchanger according to claim 1, characterized in that the ventilators are provided with a nozzle-like inlet, the latter being at least 1.2 times larger than the diameter of the rotor.

46. The heat exchanger according to claim 45, characterized in that the ventilator races of the inlet nozzle and the diffuser are decoupled with respect to physical sound via soft intermediate elements.

47. The heat exchanger according to claim 1, characterized in that with insulation glazing, a controlled connection is produced between the intermediate space of the insulating glass pane and the outside air, whereby the air flowing through said connection passes through a dust and moisture absorption filter.

48. The heat exchanger according to claim 47, characterized in that the filter is arranged in such a way that it is heated and moisture is expelled by possible sun radiation, so that said filter regenerates itself automatically.

49. The heat exchanger according to claim 1, characterized in that it is installed in a window.

50. The heat exchanger according to claim 1, characterized in that the recovery of moisture is adjustable through selection of the concentration of a calcium chloride solution.

51. The passive combined ventilation element according to claim 1 or 2, characterized in that the ventilation element contains a static element providing a flow of air with a

spin or twist before said current of air flows through the heat exchanger, driving the latter without provision being made for a ventilator.

52. The ventilation element according to claim 51, characterized in that the axis of rotation extends vertically.

53. An elastic ventilator bearing tube mounting, characterized in that an intermediate piece connecting the ventilator drive and a counterweight is retained by two elastic disks, the latter being fixable in their positions with radial displaceability and axially jointly clampable via an intermediate piece.

add A'

add B'

ADD C3